## Remarks

### Examiner Interview

A phone interview was conducted on Nov.3, 2004 between Examiner Vargas and Kevin McEnaney. The Sun 'Ringkiller' patent (US 6,121,774) and prior art PAPS methods were discussed. Focus was given to a difference between multi-sequence and single sequence applications. Focus was also given to a difference between combining signals having only one of the ringing or spin echo components and combining signals having both components. Examiner Vargas recognized these differences and suggested two action items. The first was that she needed to speak with her primary. The second was that clarifying amendments may be needed upon closer study. Examiner Vargas followed-up with a voice message on Nov. 10 suggesting that claim amendments clarifying that the combined signals are in a sequence. Reference was made to claim 19 as being a good model.

### Claim Amendments

Claim 1 has been amended to more clearly recite a combination of signals received from within a sequence.

### Rejections under 102(b)

Sun does not teach or suggest Applicant's claimed NMR signal ringing reduction that includes a combination of signals where "each signal...include[es] a spurious signal component and a spin echo component." (Independent claims 1, 19 and 31.) The Sun method for reducing ringing is an altogether different approach compared to Applicant's claimed method. In Sun, a number of NMR response sequences are acquired over multiple acquisition time periods. (Sun, Abstract.) The first acquired NMR response includes an echo train that also includes the undesired ringing effect. The next acquired NMR response includes only the undesired ringing effect. The spin echoes in this next acquired NMR response is spoiled or eliminated. (Sun, col. 4:50-58.) The level of ringing is measured from this next acquired NMR response and is used to correct the first acquired NMR response. (Sun, col. 4:58-63.) Thus, although Sun's first acquired NMR response includes both a spin echo and spurious

signal component, Sun's next acquired NMR response includes only a spurious signal component. Nearly the entire disclosure of Sun is directed to "spoiling" techniques to eliminate the spin echoes. Simply, Sun is an altogether different process to reduce ringing.

Further, with respect to dependent claims 4, 42 (new claim) and 44 (new claim), Sun does not teach or suggest combining signals that are "adjacent" to one another. Instead, Sun combines a set of spin echoes with a signal level representing the spurious component of the NMR response. The set of spin echoes is first acquired as a continuous echo train. The spurious component of the NMR response is not acquired until the acquisition of the echo train is complete. These two groups of signal are then combined. However, because the echo train and the subsequent spurious noise signal are acquired at two different time periods (Sun, col. 5:1-54), Sun cannot combine adjacent signals. In other words, the first echo of the first acquired echo is not combined with the next acquired or adjacent echo.

Further, with respect to dependent claims 41, 43 and 45 (new claims), none of the references, including AAPA, teach or suggest combination of NMR signals that are closely spaced with one another. As discussed above, Sun requires substantial intervening time between signals to be combined. Furthermore, the PAPs method discussed in Applicant's application combines NMR signals from different acquisition sequences, thereby also requiring substantial intervening time between combined signals.

In light of the above comments, Applicant respectfully traverses the rejection and request the claims be reconsidered in light of these distinctions.

The rejection of the dependent claims not specifically mentioned above are traversed for the above recited reasons and for depending from allowable independent claims.

## CONCLUSION

The Applicants believe this paper is fully responsive to each and every ground of rejection and objection cited by the Examiner, and respectfully request that the application proceed to grant.

Please charge any applicable fees, or apply any excess, to deposit account number 19-0610.

Respectfully submitted,

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Date

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